Date: October 23, 2006

State of Hawaii
Department of Land and Natural Resources
Division of State Parks
1151 Punchbowl Street, Room 310
Honolulu, Hawaii 96813

Attention: Mr. Steve Thompson

Subject: Earthquake Emergency Response Visit at Hapuna Beach State Recreation Area
Big Island, Hawaii

Dear Mr. Thompson:

On the afternoon of October 19, 2006, our senior geologist Dr. Yucheng Pan and I from Earth Tech, Inc. (Earth Tech) along with a staff of professionals from State Department of Land and Natural Resources (DLNR), Division of Parks, visited Hapuna Beach State Recreation area located in the Kona-Kohala coast. See Photo No. 1 and 2. The purpose of this site visit was to investigate potential impact of the October 15 earthquake on the various rock structures within the site.

The park is located in a pristine costal area equipped with a number of restroom structures and resting/ shelters. An examination of one of the upper restroom buildings revealed areas of damage in the rock wall venire at least on two sides of the building. See Photo No. 2 through 4. One of the supporting roof beams was also cracked at the shear zone near the column support. See Photo No. 5. Some of the concrete resting shelter structures have shown signs of damage at the concrete column support due to the force of earthquake. Cracks have developed and portions of each column have spalled. See Photo No. 6 and 7. Other concrete structures damaged as a result of recent seismic activities are the concrete pedestals at one of the resting areas near the beach. Such failure is apparently the result of combined rusting of the reinforcing bars and ground motion from the earthquake. See Photo No. 8 and 9.

A small rental cabin with reported damage was inspected. The cabin is located on the east end of the State Recreational Area. The building structure is of A-frame timber construction, and except for one of the rafters and its concrete support

foundation blocks, it appeared to be in a fair operating condition. See Photo No. 10.

Despite the damages identified above, the general condition of these structures was fair. The reported damages must be repaired as soon as possible to prevent further deterioration of the structural systems of each unit. We anticipate the cost of repair at approximately $200,000 and a period of construction of 4 months.

Prepared by:

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Photo No. 1- Paradise Grill Building at the State Recreation Area.

Photo No. 2- Upper toilet and restroom building.

Photo No. 3- Rock wall venire damaged due to earthquake.

Photo No. 4- Rock venire damage caused by ground shaking.

Photo No. 5- Perimeter support beam cracked at shear zone.

Photo No. 6- Damage to the concrete column at its base with sporadic cracking.

Photo No 7- Cracking and spalling of concrete support column.

Photo No. 8- Cracks in concrete pedestals due to combined rusting of rebars and earthquake.

Photo No. 9- Cracks in concrete pedestal.

Photo No 10- Cracking of the main roof rafter and concrete support.